

Polynuclear Aromatic Hydrocarbons in situ bioremediation treatability test; focus on contaminant disappearance by HPLC analysis. *Jessica Montañez¹, Loyda Méndez¹, Sadhana Chauhan², Terry C. Hazen².* ¹*University of Puerto Rico Mayagüez Campus, Mayagüez Puerto Rico,* ²*Ernest Orlando Lawrence Berkeley National Laboratory.*

Polynuclear Aromatic Hydrocarbons (PAHs) including Benzo(a)pyrene (BaP) are hydrocarbons containing two or more fused benzene rings. They are mostly found in the emissions from burned plant and petroleum products. One of the sites contaminated with PAHs is the United States Navy Base, Site 25 Parcel 182 at Alameda, CA. Biosparging, a bioremediation technique, is being considered for use at this site. This approach will allow the injection of air, methane, phosphorus and nitrogen to stimulate the indigenous microorganisms in the soil to increase their densities and degrade the PAHs. To establish that BaP in the soil at this site can be degraded by this technique, a treatability study is being done. Soil with no known pollution history was spiked with 10 ppm of BaP. These BaP and soil mixtures were amended with 10% methane (CH₄), 1% nitrous oxide (N₂O) and 1% triethyl phosphate (TEP). The total amount of CO₂ and CH₄ produced as a degradation product was quantified by gas chromatography (GC). Soil samples were extracted with acetone by vortex and sonication techniques. BaP recovery was quantified by High Performance Liquid Chromatography (HPLC). Vortexing was shown to be the best extraction method; however, the percent of extraction was low due to high BaP absorption to the soil. BaP concentrations decreased in every sample that contained CH₄, except for those amended with N₂O + CH₄ + TEP because it had a leakage. Unamended and CH₄ samples showed increases in biomass and microbial diversity in contrast with the amended samples, which showed low microbial density.